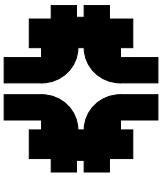

Dan Markley

Date: 06/24/2005
Rev Date:
Project: Silicon Layer 0 at SIDET
Doc. No: DM062405A
Subject: RTD Monitoring

This document describes the Dzero Layer 0 1000 ohm pt RTD monitoring system at SIDET.

Description

The Dzero Layer 0 will be tested to some partial level at SIDET. L0 has 12 1000 ohm pt at 0C temperature RTD sensors. These sensors will be monitored by a Siemens 505 Programmable Logic Controller (PLC).

The RTD interface to the PLC is done through a Control Technology Inc (CTI) 2557 16 channel RTD input module. The 12 RTD's will be wired to the 2557 using the 4 wire method, which can automatically compensate for up 20 ohms of resistance per lead. The 2557 passes the digital resistance value of each channel to the PLC using the back plane. The resistance is in the form of a scaled integer between 0 and 60,000 linearly representing 0 to 1300 ohms.

The 505 PLC converts the integer resistance to real resistance with a simple math equation in a special function. This special function will also convert the real resistance to temperature in degrees C using a standard 1000 ohm pt curve fit.

The PLC is programmed to actively interlock the 12 RTD inputs so that they must be between –30C and +30C in order for the PLC relay summed output to be closed. This PLC output relay can be wired to external equipment such as a chiller or power supply. If the temperature of any of the RTD's ventures outside of the –30C to +30C window the Relay contact will open. This PLC relay is not latched and will close if all 12 RTD's return back to the –30C to 30C window.